UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION:
EL DORADO AND AMADOR COUNTIES

# FOOTHILL FARM AND ORCHARD NEWS

**ISSUE #8** **APRIL , 2006**

Dear foothill grower: 58 inches of precipitation and counting as of April 10, according to the Camino CIMIS station! With the continued wet weather and buds swelling, many of you are thinking about disease control. This issue includes information to assist you in disease management decision-making in the next few months.

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**SPECIAL DISEASE ISSUE:**

- APPLE SCAB TRIAL RESULTS: 3 YEARS OF LOCAL STUDIES
- EXCERPTS FROM THE U.C. "EFFICACY AND TIMING OF FUNGICIDES, BACTERICIDES, AND BIOLOGICALS FOR DECIDUOUS TREE FRUIT, NUT CROPS AND GRAPEVINES 2006": WALNUTS, APPLE&PEAR, CHERRIES, GRAPEVINES, PEACH AND NECTARINE
- CENTRAL VALLEY POSTHARVEST NEWSLETTER INCLUDED-SUBSCRIBE NOW TO RECEIVE FUTURE ISSUES (SUBSCRIPTION FORM ATTACHED)

## APPLE SCAB TRIAL RESULTS: 3 YEARS OF LOCAL STUDIES

Apple scab, caused by the fungus *Venturia inaequalis*, affects apple foliage beginning at green tip if there are rainy conditions. Infections can be so bad, if not controlled, that yield loss can occur and fruit will be smaller with, of course, the big ugly brown patches. The fungus overwinters in infected leaves on the ground-when rains hit spores are splashed up onto susceptible tissue beginning at green tip. Infection can occur even if temperatures are cool, it just takes a longer period of wetness when it is cooler. So, for infection you have to have: spores present (most orchards have a resident population of scab spores-worse in orchards where control has not been implemented or hasn't been effective); fruit and foliage must be wet for a certain length of time; and temperatures must be in a certain range, correlated to time of wetness. The "Mills and La Plante Table" tells you how many of hours of wetting are required at what temperatures to get infection. So, for example, you need 20 hours of wetness when the temperature is 45F to get apple scab infection. Basically, the cooler the temperature, the greater the number of hours needed for infection (but you can still get infection when it is cold!). You can view that table on the UC IPM website at: http://www.ipm.ucdavis.edu.

Fungicides used to control scab have either "protectant" or "eradicant" ( or "kickback") activity, or both. It is important to know what activity the fungicide you are using has, and for how long it lasts. Protectant fungicides need to be applied prior to infection and reapplied as new tissue comes out and grows. Dithane, for example, has protectant activity for about 10 days (of the tissue sprayed, if new tissue comes out during that time, it is unprotected)-but Dithane does not have any eradicant activity, which means, if it has rained and you haven't been able to get out and get a scab spray on, Dithane will not help control infections that have already started. You would need to choose instead a fungicide

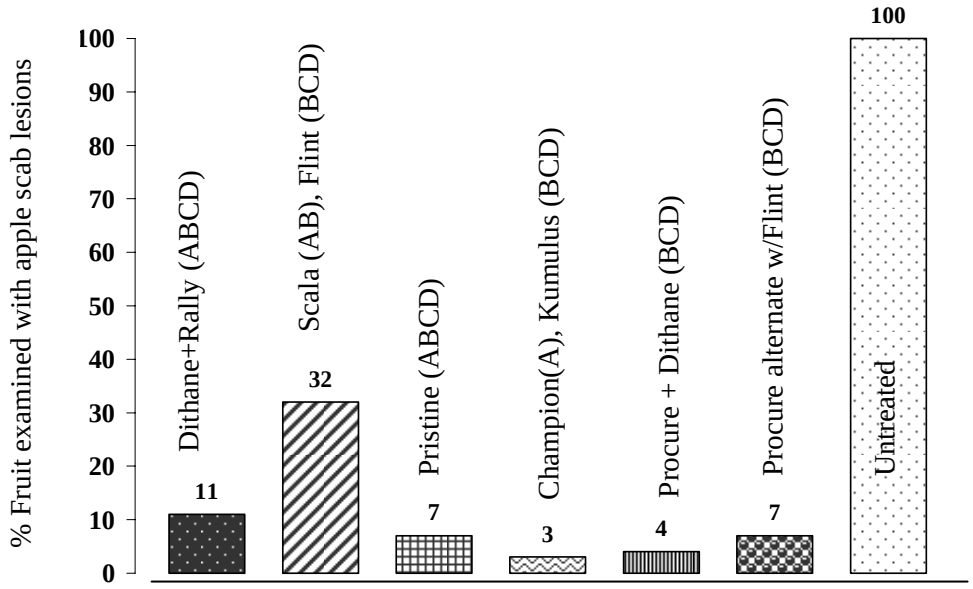
with eradicant activity, like Rally or Flint. Key infection periods are considered to be: green tip, ½ inch green, "pink", bloom, and petal fall, but vary year to year depending on rainy conditions.

For the past several years, we have conducted local apple scab trials in cooperation with Doug Gubler, Extension Plant Pathologist at UC-Davis, cooperating fungicide companies and local apple growers. These trials have tested some relatively new fungicides such as Pristine, Scala, and Procure, against standards such as Dithane and Rally and have also included the organic alternatives of copper (Champion) followed by sulfur (Kumulus).

**Materials tested during apple scab trials in Camino, Ca., 2003-2005.**

| Product | Active Ingredient | Class | Manufacturer |
|---|---|---|---|
| Champion WP | Copper Hydroxide (copper elemental) | Inorganic | Nufarm Americas |
| Dithane 75 DF | Manganese, Zinc, Ethylene bisdithiocarbamate | Carbamate | MicroFlo Dow Agro |
| Flint 50WG | Trifloxystrobin | Strobilurin | Bayer |
| Kumulus DF | Sulfur, micronized | Inorganic | MicroFlo |
| Pristine | Pycaclostrobin, Boscalid | Stobilurin and carboxyanilide | BASF |
| Procure 50WS | Triflumizol | DMI-Imidazole | Uniroyal Chemical |
| Scala | Pyrimethanil | Anilinopyrimidine | Bayer |
| Serenade | *Bacillis subtilis* bacteria | Biological | Agraquest |
| Rally 40W | Myclobutanil | DMI-Triazole | Dow Agro |

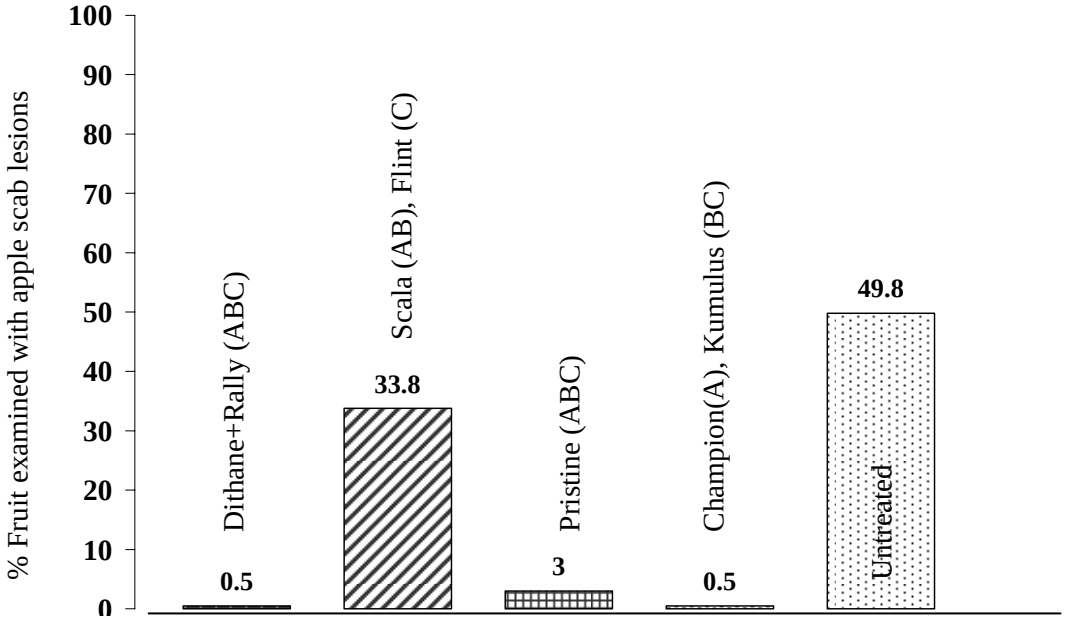
**Fig. 1. Percent of fruit showing apple scab lesions (n=200 fruit), 2005 trial.**




Treatments applied. Letters correspond to timing of application: A= pink, B=early bloom, C=late bloom, D=petal fall.

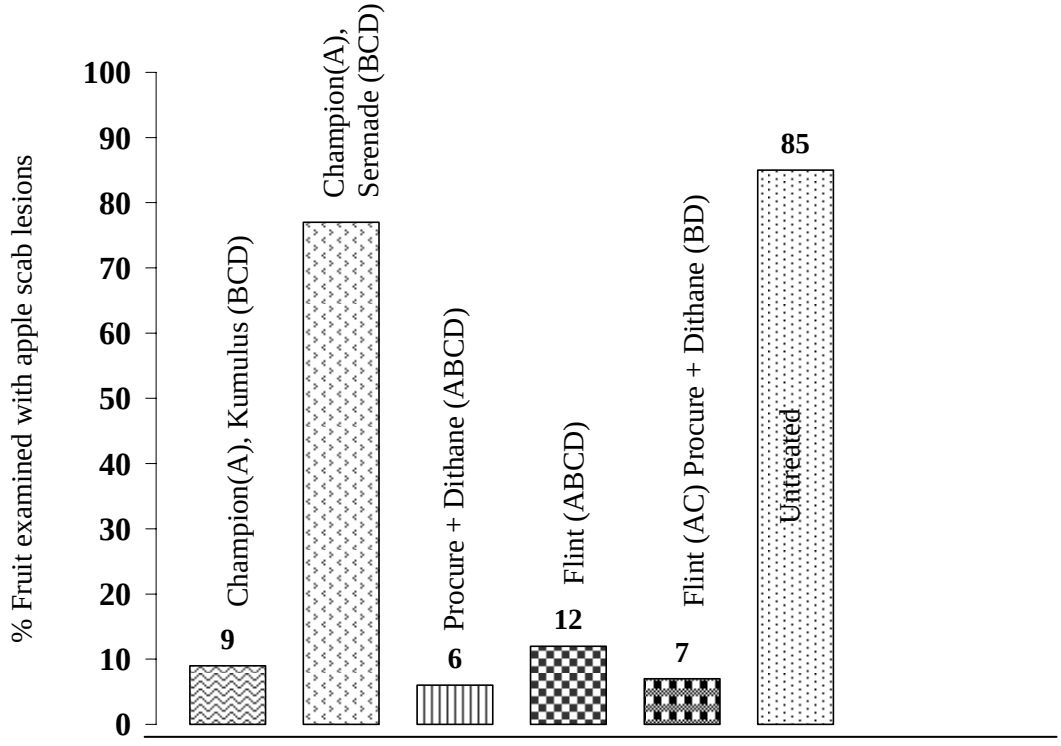
 

**Fig. 2 Percent of fruit showing apple scab lesions (n=400 fruit), 2004 trial.**




Treatments applied. Letters correspond to timing of application: A= ½"green B=pink, C=petal fall.

**Fig. 3. Percent of fruit showing apple scab lesions (n=400 fruit), 2003 trial.**




Treatments applied. Letters correspond to timing of application: A= ½"green B=pink, C=pink-bloom, D= petal fall.

Figures 1-3 above show the results, in disease "incidence" or the percent of fruit examined that had any apple scab infection (results on severity of infection are not shown here). Each year the timing of application was slightly different, due to the rainfall that year. We also tested different materials most years, but all three years included the organic option, Champion followed by Kumulus, and an untreated control. Disease incidence ranged in the untreated ranged from about 49% in 2004, to 100% in 2005. The organic option of Champion followed by Kumulus did surprisingly well in every year, however, when Serenade was substituted for Kumulus in 2003, disease incidence was high. Procure, either alternated with Flint or tank mixed with Dithane, gave better scab control in 2005 than the grower standard of Dithane + Rally. Pristine also gave good control last year in our trial.

Like insecticides, it is important to remember to rotate fungicide classes (or mode of action) for resistance management. The apple scab fungus can become resistant if you use the same fungicide every spray, year after year. If your scab control last year was not satisfactory, you should consider rotating materials and be sure your timing and spray coverage is adequate.

**Table 2. Period of Effectiveness for listed Apple Scab fungicides taken from the UC IPM website at http://www.ipm.ucdavis.edu/PMG/r4100411.html**

| | PERIOD OF EFFECTIVENESS[1] | |
|---|---|---|
| **FUNGICIDE** | **When used as protectant (days)** | **When used as kickback[2] (hours)** |
| Captan | 10 | 0 |
| Copper | 7-10 | — |
| Dithane | 10 | 0 |
| Flint | 7-10 | 100 |
| Lime sulfur | 5-7 | 36 |
| Procure | 7-10 | 72 |
| Rally | 4 | 96 |
| Rubigan | 3-4 | 96 |
| Sulfur | 5-7 | 0 |
| Topsin M | 10 | 36-48 |
| Vangard | 7-10 | 48 |
| Ziram | 7-10 | 0 |

— Information not available.

[1] Where range of days or hours is given, the difference reflects application rates -higher rates offer longer protection.

[2] Eradicant fungicides have systemic action. Some are translocated within the host tissue and are able to kill the scab fungus up to a certain length of time after infection occurs. This is called the kickback period. Because kickback periods may change, always check the label for the most recent information. Kickback is calculated from the *beginning* of an infection period, as determined by the Mills and LaPlante table.

**PESTICIDE APPLICATOR'S SAFETY TIP: Do you know how to properly store your respirator to increase its shelf life?**

You should assure that your personal protective equipment (PPE) is kept in proper working condition. Respirator facepieces should be washed in mild soapy water after each use (do not wash the cartridge!). The cartridges should be wiped with a soft cloth to remove pesticide residue and stored in a clean plastic bag, away from pesticide materials (don't just hang it on the back of your tractor!!). The cartridge continues to work to filter air even when you are not wearing it. Storing it in a clean plastic bag keeps the cartridge from having to work to filter. Remember to replace your cartridge when necessary-it is recommended to replace the filter after a day's use of spraying, unless the cartridge packaging indicates otherwise. If it is hard to breathe with your respirator on, the cartridge filter unit could be clogged and needs to be changed.

**Precipitation (in inches) comparison of the last 3 years**

| Month | **2003-2004** | **2004-2005** | **2005-2006** |
|---|---|---|---|
| October | 0.04 | 6.61 | 0.75 |
| November | 0.83 | 4.49 | 2.72 |
| December | 8.86 | 0 | 20.63 |
| January | 4.21 | 0.28 | 7.2 |
| February | 8.58 | 0.59 | 5.31 |
| March | 1.77 | 1.03 | 14.21 |
| April | 0.55 | 1.23 | 7.32 |
| May | 0.16 | 4.65 | |
| Total | 25.00 | 18.88 | 58.2 |

**Save the date: June 7-8 Agritourism and Nature Tourism conference comes to El Dorado County!** The conference will be held at Gold Hill Winery June 8 (a pre-conference optional tour is being planned for June 7) and will include sessions on the effects of county general plans and zoning on agritourism; the state of Sierra agriculture and the Heritage economy; creating a special event to highlight your cultural heritage; and value-added products including commercial kitchens; among others. Look for the brochure in your mailbox soon!